Proposed Plan
Conroe Creosoting Superfund Site

Conroe
Montgomery County, Texas

July 18, 2003

EPA Announces Proposed Plan for the Conroe Creosoting Superfund Site

In this Proposed Plan, the United States Environmental Protection Agency (EPA) presents summary information regarding EPA's recent removal action which is addressing soil and sediment contamination. The Proposed Plan also presents the remedial alternatives to address ground water contamination and the risks associated with the threat of release of hazardous substances at the Conroe Site. The EPA has conducted its activities in connection with the Conroe Site in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund), 42 U.S.C. § 9601 et seq., and the National Oil and Hazardous Substance Contingency Plan (NCP), 40 C.F.R. Part 300.

The EPA is issuing this Proposed Plan in accordance with and as part of its public participation responsibilities under CERCLA §117(a), 42 U.S.C. § 9617(a) and 40 C.F.R. §300.430(f)(2). The recommendations and alternatives set forth in this Proposed Plan are based on information and documents contained in the Administrative Record file for the Conroe Site.

The EPA Region 6 office is the lead agency for this Site. The Texas Commission on Environmental Quality (TCEQ) is the support agency and has provided technical support and review through a cooperative agreement with EPA.

This Proposed Plan highlights information contained in the Administrative Record for the Conroe Site which includes the Off-Site Assessment Report, the Remedial Investigation (RI) Report, Feasibility Study (FS) Report, the Human Health Risk Assessment (HHRA) Report, and other documents and reports used in preparing this Proposed Plan. The EPA encourages the public to review those documents to obtain more information about the Superfund activities that have been conducted at the Conroe Site. The EPA also encourages the public to participate in the decision-making process for the Site. The Administrative Record file is available at the following information repository locations:

The Purpose of this Proposed Plan is to:

- Provide summary results of the U.S. Environmental Protection Agency's (EPA) removal action conducted in 2002 - 2003 to address soil and sediment contamination at the Conroe Creosoting Company Superfund Site (Conroe Site) located in Conroe, Montgomery County, Texas;
- Identify EPA's rationale and information for recommending no further action for Site soils and sediments;
- Provide summary results of the ground water investigation completed in 2003 and identify the remedial alternatives to address ground water contamination at the Site;
- Solicit public review and comment on the alternatives presented as well as on information contained in the Administrative Record file; and,
- Provide information on how the public can be involved in the remedy selection process for the Conroe Site.

Montgomery County Memorial Library
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1445 Ross Avenue, Ste. 12D13
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Texas Commission on Environmental Quality
Building E, Records Management, First Floor
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Austin, Texas 78753
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SITE BACKGROUND

The Conroe Creosoting Company Superfund Site (Conroe Site) is an abandoned wood-treating facility located at 1776 E. Davis Street, Conroe, Montgomery County, Texas (Figure 1). The wood-treating facility occupies approximately 147 acres and operated from 1946 until March 1997. The Site is bordered to the east by residential property, to the south by State Highway 105, and to the north and west by forested land. The facility treated lumber, railroad cross-ties, poles, and fence posts. Three wood preserving processes used pentachlorophenol (PCP), creosote, and copper chromated arsenate at the facility. The wood preserving processes used pressure to force a solution of PCP dissolved in diesel, or creosote dissolved in diesel, or a solution of copper chromated arsenate, into the pore spaces of the wood. The treated wood was then allowed to dry on a drip pad. The facility was closed down by the Montgomery County Tax Assessor/ Collector in March 1997, due to delinquent taxes. The Site's assets were sold by the county at an auction. The land, waste management units, and process units remained properties of Conroe Creosoting Company.

Several compliance investigations were conducted by the Texas Commission on Environmental Quality (TCEQ), and its predecessor agencies, at the Conroe Creosoting Company during the 1980s and 1990s. Regulatory violations documented at the Site resulted in the issuance of Agreed Orders in 1994 and 1999 to the Conroe Creosoting Company. On September 20, 1996, JHA Environmental Services, Inc., reported to the Conroe Creosoting Company the sample results which indicated elevated levels of creosote compounds, arsenic, and chromium in the soil and shallow ground water. On June 1, 2001, an inventory of all tanks and cylinders and the types of material that they either contain or used to contain was prepared by a consultant to the Conroe company. On March 22, 2001, the TCEQ inspectors observed leaking containers at the Site. During the Expanded Site Inspection conducted by the TCEQ the week of November 26, 2001, releases were sampled and hazardous substances were detected in the soils and sediments.

Surface impoundments containing waste were draining off-site via drainage canals at the Conroe Site. A drainage ditch running east to west, north of the process areas and south of the former maintenance shop, contains contaminated sediment. Runoff from the Site flows overland to the east to Little Caney Creek and to the west to Stewart's Creek. Runoff from the process area and drainage ditch flows toward Stewart's Creek. Secondary containment areas which held contaminated water were observed to be cracked and/or broken in several areas, and the contaminated water was spilling out. Soil throughout the pentachlorophenol and creosote process areas was heavily contaminated with semivolatile organic compounds, pesticides, and inorganics. A waste inventory conducted on June 1, 2001, listed several cylinders and tanks containing copper chromated arsenate solution, creosote sludge, pentachlorophenol solutions and solids, and tank bottoms. The total quantity of hazardous waste in the tanks and containers, other than drums, was estimated to be over 100,000 gallons. Approximately sixty-two (62) drums were stored in an on-site shed. During the November 2001 ESI sampling event, an alleged waste burial area was determined by TCEQ to be a hazardous waste dumping area.

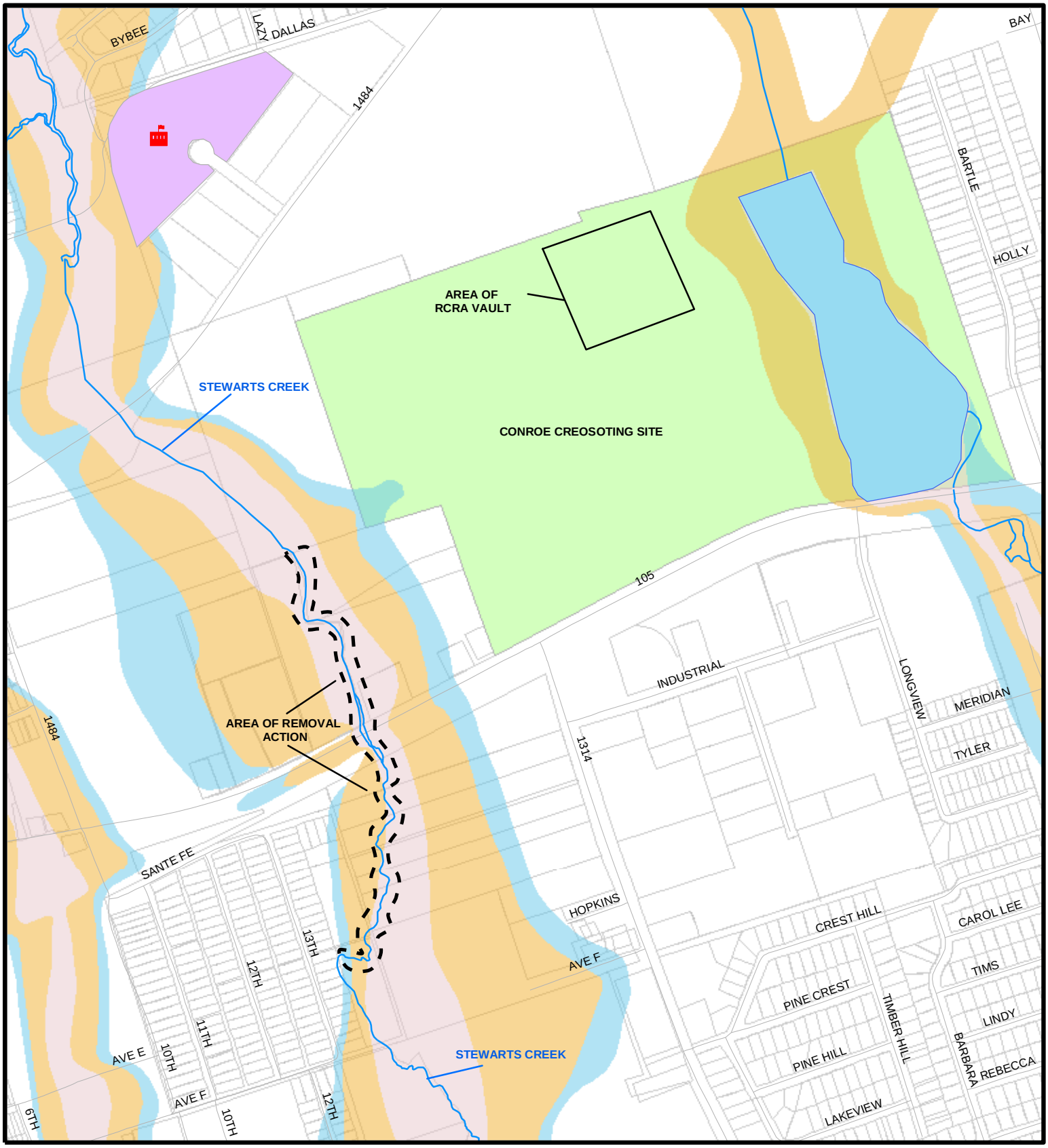
On April 30, 2003, EPA proposed to add the Conroe Creosoting Company Superfund Site to the National Priorities List (NPL) of Superfund sites. See Federal Register Listing (FRL-7490-4), Volume 68, Number 83, Pages 23094-23101, Proposed Rule No. 39.

SUMMARY OF SITE CHARACTERISTICS

Ground Water Investigation

Ground water is the major source of public and industrial water supplies in Montgomery County, Texas. Three aquifers, in order of increasing depth, furnish the ground water used in the County: the Chicot Aquifer, the Evangeline Aquifer, and the upper 300 feet of the Jasper Aquifer. The City of Conroe municipal supply wells are screened in the deeper Evangeline sands at a depth of 825 - 1190 feet. Single-user private supply wells located near the Conroe Site are screened in the shallow Chicot Aquifer at depths greater than 100 feet. A private water supply well located at the Conroe facility was screened at a depth of 150 - 165 feet.

The Site hydrogeology was investigated through the installation of 24 monitoring wells (Figure 2), cone penetrometer testing, and a site-wide surface resistivity survey. The Site hydrogeology is relatively uniform with a confining clay/silty clay layer present from the ground surface to approximately 60 feet below ground surface. Thin discontinuous layers of clayey silts and sand are present in the clay layer at certain locations. Underneath this clay layer is



LEGEND

- ROADS
- CREEKS
- AREA OF REMOVAL ACTION
- SITE
- RCRA VAULT
- SCHOOL

FLOODPLAIN

- 100 YEAR
- 100 YEAR
- 500 YEAR

SOURCE: CITY OF CONROE - PUBLIC WORKS DEPT
TDD: 02-08-0015
CERCLIS: TX008091951

US EPA REGION 6
START-2

FIGURE 1

SITE LOCATION MAP
CONROE CREOSOTING SITE
CONROE, MONTGOMERY COUNTY, TEXAS

DATE: 06/2003 SCALE: AS SHOWN

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ELEMENTARY SCHOOL
CHURCH
AIRPORT RD
PROPERTY BOUNDARY
POLE MACHINE PLANT
RCRA VAULT
PILED WOOD/DEBRIS
STORAGE SHED
FORMER PIT
LUMBER PILES
P-7
RESIDENTIAL AREA
BARTLE RD
LAKE
MW2A
MW2B
PLANE FAST
TRUCKING COMPANY
LUMBER SHED
KILNS
PLANE FAST
TRUCKING COMPANY
STORAGE
MW1A
MW1B
REWORK AREA
BOILER
DRAINAGE CANAL
MW3A
MW3B
MISC. SHEDS AREA
CCA PROCESS AREA
CONROE CREOSOTING
OFFICE
MW10A
MW10B
MW9A
MW9B
CONROE TRUCK AND TRAILER
PARTS COMPANY
CREOSOTE/PCP
PROCESS AREA
TANK BATTERY
MW7A
MW7B
MW11A
MW14
BIG TIN BARN
LUMBER COMPANY
MW8A
MW8B
RESIDENCE
MW13
MW6A
MW6B
MW4A
MW4B
MW12
HWY 105
BUSINESS PARK
MW5A
MW5B
RR SALVAGE
YARD
BOB PACKER
AUTO REPAIR
R.R.
INDUSTRIAL RD
LONGVIEW RD

LEGEND

- SHALLOW MONITORING WELL CLUSTER
- SHALLOW MONITORING WELL
- DEEP MONITORING WELL
- PIEZOMETER
- ONSITE WATER WELL
- BUSINESS PARK AREA
- RESIDENTIAL AREA
- RCRA VAULT

0 150 300 600 Feet

N

CERCLIS NO: TX008091951
TDD NO: 06-03-04-0002
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US EPA REGION 6
START-2

FIGURE 2
MONITOR WELL
LOCATION MAP
CONROE CREOSOTING SITE
CONROE, MONTGOMERY COUNTY, TEXAS

DATE	PROJECT NO	SCALE
JUN 03	12632.001.143.2335	AS SHOWN

a 40-foot thick sand unit which is the uppermost water bearing sand of the Chicot Aquifer (Sand-1). The Sand-1 aquifer becomes coarser grained with depth with a gravelly sand at the bottom of the unit. A silty clay ranging in thickness from 10 - 20 feet separates the Sand-1 unit from the Sand-2 unit. The Sand-2 unit occurs at a fairly constant depth of 130 feet below ground surface.

The Sand-1 and Sand-2 units are confined aquifers with a ground water flow direction at the Conroe Site to the south-southwest and a gradient of 0.0022 ft/ft (Figure 3). There is a slight upward gradient between the Sand-2 and Sand-1 units. Aquifer tests were not conducted during the RI, but the Sand-1 unit appears to be a high yielding water bearing unit since substantial quantities of water were removed during development while never dewatering the wells. The average hydraulic conductivity values for the Chicot Aquifer in Harris County to the south is 500 gallons per day per square foot (167 feet/day). This average hydraulic conductivity value is likely much higher than the value for the Sand-1 aquifer.

Contamination was only detected in the Sand-1 aquifer. The principal contaminants detected in the ground water include naphthalene and PCP with maximum detected concentrations of 174 micrograms per liter (µg/L) and 94 µg/L, respectively (Figure 4). The Sand-1 well couplets were installed in the upper and lower sections of the unit in an effort to detect the presence of any non-aqueous phase liquid (NAPL) in the aquifer. A separate NAPL was not detected in the monitoring wells and the low dissolved phase concentrations do not indicate the presence of a separate NAPL in the ground water. The ground water contamination is located under the former tank battery and the adjacent creosote/PCP process area, which is the expected source of the ground water contamination. The three monitoring wells and the existing on-site water supply well (located next to the MW-9 well couplet) did not detect contamination from the Site.

The most frequently detected inorganic analyte in the ground water was chromium, with lesser amounts of barium and arsenic. Chromium was detected above the Safe Drinking Water Act Maximum Contaminant Level (MCL) of 100 µg/L in 13 of the 23 newly installed monitoring wells. Typical well construction involves the use of a cement-based mixture of bentonite and water in order to set the casing in place. The cement used at the Conroe Site was manufactured by TXI and consisted of Portland Type I/II cement supplied by the drilling subcontractor. A sample of the cement was collected and sent for laboratory analysis. Sample results from the cement contained 665 milligrams per kilogram (mg/kg) chromium. Based on this result from a standard well construction material, a full round of redevelopment and resampling (third ground water field event) was completed between June 9 and June 27, 2003. As part of the resampling effort, three sequential ground water samples were collected from MW-9A. The first sample was collected immediately after the pump was started in an effort to collect "stagnant" water from within the well. The second and third samples were collected approximately two-thirds through the purge effort and the third sample was collected at the completion of the well purge. Results from the initial "stagnant" sample collected from MW9A exhibited chromium at 252 µg/L. The second and third sample collected from the well were both below 5.3 µg/L. The results indicate that chromium concentrations in the well significantly decrease as "stagnant" well water is removed from and replaced with formation water.

Facility Investigations

Investigations conducted at the Site include an Environmental Site Assessment (ESA), an Expanded Site Inspection (ESI), Removal Assessment, and Off-Site Assessment. The purpose of the ESA was to determine if contamination was present in surface soils, subsurface soils, and shallow ground water in nine discrete areas of the former facility. The Site investigations identified arsenic, chromium, PCP, and polycyclic aromatic hydrocarbons (PAHs) as chemicals of concern for the soils and sediments at the Conroe Site.

The EPA Region 6 Superfund Technical Assessment and Response Team (START-2) conducted a removal assessment of the facility in January 2002. The tanks, cylinders, impoundments, drums and soils were sampled and analyzed for volatile organic compounds, semi-volatile organic compounds, and metals. In addition, five soil samples were analyzed for dioxins and furans. An initial estimate of approximately 65,000 cubic yards of soils exceeded the EPA Region 6 Human Health Medium-Specific Screening Levels (MSSL) for either arsenic, chromium, pentachlorophenol, total creosote compounds, or dioxin and furans.

Approximately one-half mile downstream of the probable point of entry (PPE) to Stewart's Creek is a wetland as defined by 40 C.F.R. § 230.41, located along the banks of Stewart's Creek. Analytical results of samples collected from the wetland area document contamination attributable to the Site. The ESI found high levels of contamination attributable to the Site in Stewart's Creek sediments. Little Caney Creek sediments contained low levels of contamination attributable to the Site.

In September 2002, the EPA initiated a removal action of on-site structures and soils. Additional sediment samples were collected from Stewart's Creek in April 2003. Upon analysis of the sediment data, EPA conducted a removal action within Stewart's Creek in conjunction with the removal action taking place on-site. The Stewart's Creek removal action included approximately 1,000 stream feet of sediments from the PPE to Stewart's Creek to State Highway 105. South of Highway 105, approximately 1,500 stream feet of Stewart's Creek sediments were also removed. See Figure 1.

SCOPE AND ROLE OF RESPONSE ACTION

At this Site, the EPA removal action started in September 2002 has addressed the principal threat wastes comprised of contaminated soil, sludge, and waste at the former process areas. The contaminated materials that exceeded health based levels at the Site, drainage areas, and Stewart's Creek have been excavated and are being placed in an on-site Resource Conservation and Recovery Act (RCRA) containment cell. Placing the contaminated materials in an on-site RCRA cell will prevent the movement and migration of contaminants to the Site ground water zones. Contaminated ground water is neither a principal nor a low-level threat waste although a non-aqueous phase liquid (NAPL) in the ground water may be considered a source material. A separate NAPL phase has not been detected in the monitoring wells and thus the remedial alternatives do not address a principal threat waste. Because the contaminated soils and sediments are being addressed through EPA's removal actions, only remedial alternatives for the ground water were evaluated under this proposed plan. The ground water alternatives, including the preferred alternative, will address the final exposure pathway identified for the Conroe Creosoting Company Site.

SUMMARY OF SITE RISKS

The U.S. Environmental Protection Agency (EPA) conducted a human health risk assessment (HHRA) as part of the remedial investigation/feasibility study (RI/FS) for the Conroe Creosoting Company Superfund Site. The purpose of the HHRA is to characterize the potential human health risks associated with exposure to site-related chemicals under current and proposed future land use conditions. The current and reasonably anticipated future land and ground water use for the Conroe Site is an industrial reuse scenario based on past use of the Site and the long-term storage of contaminated soil in the on-site RCRA vault.

From the ground water sampling, carcinogenic (estimated lifetime cancer risk [ELCR]) and noncarcinogenic (hazard index [HI]) risk estimates were calculated for the following exposure scenarios: a reasonable maximum exposure (RME) for both a residential adult and child; and, a worst-case exposure scenario using the maximum detected concentration for both a residential adult and child, central tendency exposure (CTE).

Under the residential adult age-adjusted and child RME scenarios, the cumulative ELCR for all carcinogenic contaminants of potential concern (COPCs) is $1x10^{-4}$ and $4x10^{-5}$, respectively. The noncarcinogenic HI is 5.6 and 10.4 for the adult age-adjusted and child RME scenarios, respectively. Under the residential adult age-adjusted and child worst-case exposure scenarios, the cumulative ELCR for all carcinogenic COPCs is $7x10^{-4}$ and $2x10^{-4}$, respectively.

Future Industrial Worker

For the potential future industrial worker who uses ground water from either the Sand-1 or Sand-2 aquifer as drinking water supply, the estimated hazard index is 0.1 indicating that noncarcinogenic effects are unlikely from the exposure to shallow ground water used as tap water. The estimated cancer risk is 3×10^{-6} to 8×10^{-7} for the Sand-1 aquifer which is less than the excess lifetime risk range of 10^{-4} to 10^{-6}. The majority of the excess cancer is attributable to Trichloroethene (TCE) and pentachlorophenol. The exposure point concentration (EPC) of 1.2 µg/L for TCE in the shallow ground water does not exceed the MCL of 5 µg/L. However, the EPC of 2.7 µg/L for pentachlorophenol in the shallow ground water exceeds the MCL of 1 µg/L. The estimated cancer risk is 3×10^{-5} to 8×10^{-6} for the Sand-2 aquifer which is within the lifetime cancer risk range of 10^{-4} to 10^{-6}.

Current and Future Resident

For the potential resident who uses ground water from either the Sand-1 or Sand-2 aquifer as a drinking water supply, the estimated hazard index is 0.6 to 0.3. These results indicate that noncarcinogenic effects are unlikely from the exposure to ground water used as tap water. The estimated cancer risk is 5×10^{-3} to 6×10^{-4} for the Sand-1 aquifer which exceeds the excess lifetime risk range of 10^{-4} to 10^{-6}. The majority of the excess cancer risk is attributable to chromium. The EPC of 103 µg/L for chromium in the shallow ground water exceeded the MCL of 100 µg/L which is a product of the grout contamination from the monitoring well. The estimated cancer risk is 1×10^{-2} to 2×10^{-3} for the Sand-2 aquifer which exceeds the excess

ELEMENTARY SCHOOL
CHURCH
AIRPORT RD
PROPERTY BOUNDARY
POLE MACHINE PLANT
RESIDENTIAL AREA
BARTLE RD
STORAGE SHED
FORMER PIT
LUMBER PILES
PILED WOOD/DEBRIS
P-7
168.29
CPT/ROST02
CPT/ROST17
CPT/ROST15
MW2A
MW2B
168.3
LAKE
LUMBER SHED
KILNS
PLANE FAST
TRUCKING COMPANY
168
MW1A
MW1B
167.72
PLANE FAST
TRUCKING COMPANY
STORAGE
REWORK AREA
BOILER
CPT06
DRAINAGE CANAL
MISC. SHEDS AREA
CCA PROCESS AREA
CONROE CREOSOTING
OFFICE
CPT/ROST13
167
CPT08
MW3A
MW3B
166.90
MW10A
MW10B
166.88
MW9A
MW9B
167.00
CONROE TRUCK AND TRAILER
PARTS COMPANY
CPT/ROST16
CPT/ROST04
CPT05
CREOSOTE/PCP
PROCESS AREA
CPT/ROST01
CPT/ROST10
TANK BATTERY
MW7A
MW7B
166.75
CPT/ROST14
CPT/ROST12
MW11A
166.01
MW14
CPT/ROST11
CPT/ROST03
RESIDENCE
BIG TIN BARN
CPT/ROST09
LUMBER COMPANY
MW13
166
MW4A
MW4B
165.99
MW6A
MW6B
165.83
MW8A
MW8B
165.19
HWY 105
MW12
BUSINESS PARK
MW5A
MW5B
165.52
INDUSTRIAL RD
LONGVIEW RD
RR SALVAGE
YARD
BOB PACKER
AUTO REPAIR
R.R.

LEGEND

- CPT/ROST LOCATIONS WITH SIGNIFICANT DETECTION
- CPT/ROST LOCATIONS WITH NO SIGNIFICANT DETECTION
- CPT LOCATION - NO ROST DATA
- SHALLOW MONITORING WELL CLUSTER
- SHALLOW MONITORING WELL
- DEEP MONITORING WELL
- ONSITE WATER WELL
- BUSINESS PARK AREA
- RESIDENTIAL AREA
- 167 GROUNDWATER LEVELS IN FEET

0 150 300 600 Feet

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CERCLIS NO: TX008091951
TDD NO: 06-03-04-0002
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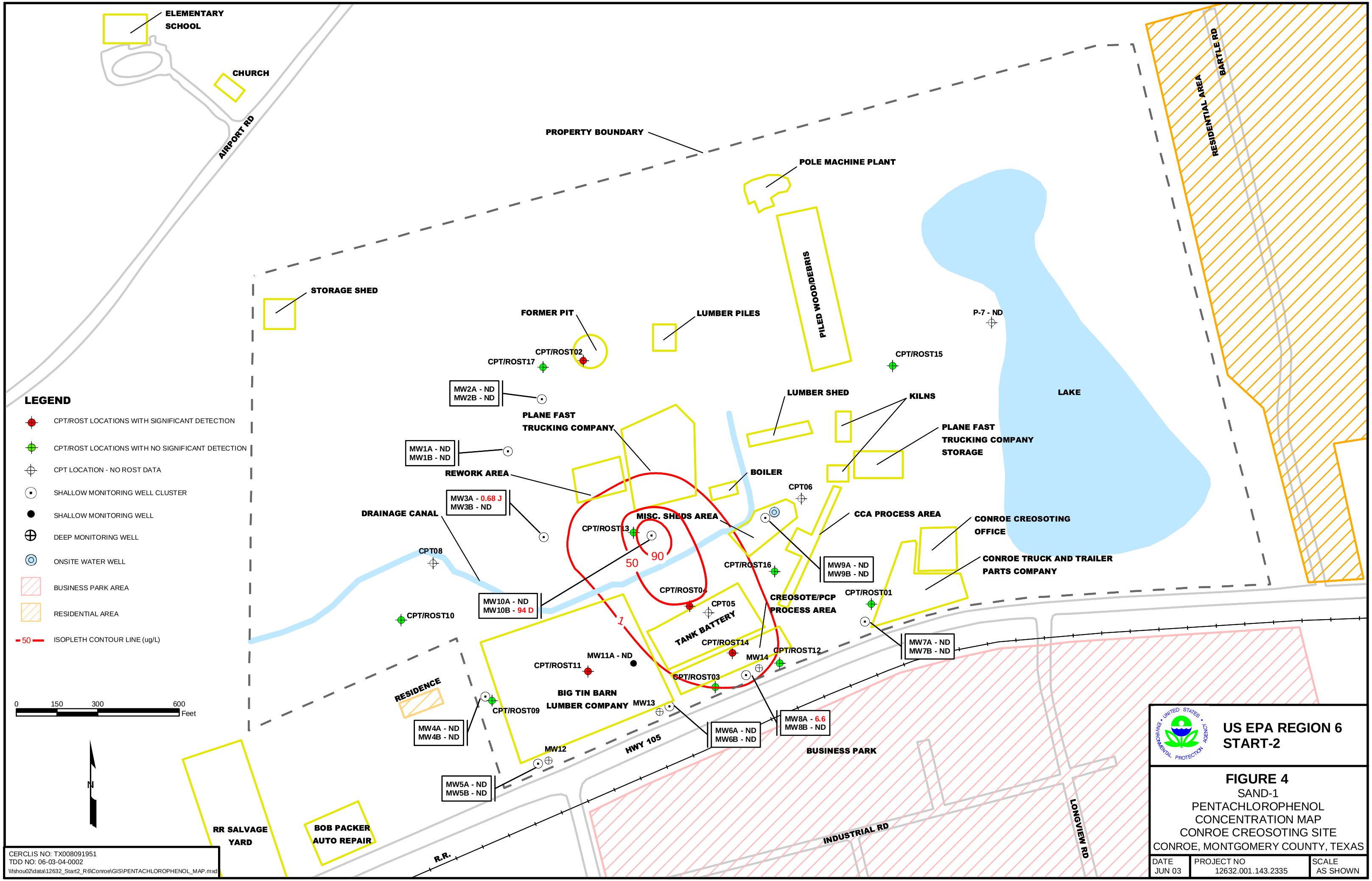
START-2

FIGURE 3

POTENTIOMETRIC LEVEL MAP
SAND-1 JUNE 17, 2003
CONROE CREOSOTING SITE
CONROE, MONTGOMERY COUNTY, TEXAS

DATE	PROJECT NO	SCALE
JUN 03	12632.001.143.2335	AS SHOWN



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TDD NO: 06-03-04-0002
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US EPA REGION 6
START-2

FIGURE 4
SAND-1
PENTACHLOROPHENOL
CONCENTRATION MAP
CONROE CREOSOTING SITE
CONROE, MONTGOMERY COUNTY, TEXAS

DATE	PROJECT NO	SCALE
JUN 03	12632.001.143.2335	AS SHOWN

lifetime risk range of 10^{-4} to 10^{-6}. The majority of the excess cancer risk is attributable to chromium which is a product of the grout contamination from the monitoring well. The EPC of 335 µg/L for chromium in the deep ground water exceeded the MCL of 100 µg/L.

For the current resident who is exposed to surface soil, the maximum concentration of benzo(a)pyrene of 0.18 mg/kg would result in an excess cancer risk of approximately 3 x 10^{-6} which is within the excess lifetime risk range of 10^{-4} to 10^{-6}. For the current resident who is exposed to surface soil, the maximum concentration of arsenic of 4.7 mg/kg would result in an excess cancer risk of approximately 1 x 10^{-5}. The maximum arsenic concentration of 4.7 mg/kg exceeds the Region 6 screening level of 0.4 mg/kg but is within the Region 6 background range of 1.1 to 16.7 mg/kg and is below the TCEQ median background level of 5.9 mg/kg.

Recreational Visitor to Stewart's Creek

The screening process indicates that the recreational visitor who is exposed to sediment from Stewart's Creek would have an excess cancer risk within the excess lifetime risk range of 10^{-4} to 10^{-6}, or 1 cancer in 10,000 individuals to 1 cancer in 1,000,000 individuals. In addition, the screening process indicates that exposure to flood plain surface soils from along Stewart's Creek would have an excess cancer risk within the excess lifetime risk range of 10^{-4} to 10^{-6}.

Ecological Risks

In addition to the HHRA, an Ecological Risk Assessment (ERA) was prepared to evaluate the risk to the environment posed by existing levels of contamination in the soil, surface water, and sediment on and in the vicinity of the Site.

Flood plain soils

Flood plain soils do not appear to present an unacceptable ecological risk from direct exposure to COPCs. However, several PAHs did not have established screening levels.

The detection of polychlorodibenzo(p)dioxins (PCDDs) and polychlorodibenzofurans (PCDFs) expressed as TCDD equivalents in flood plain soils indicate the potential COPCs to bioaccumulate in the terrestrial food web. The TCDD equivalent levels were detected below the human health level of 1 µg/kg.

Sediments

Stewarts Creek sediments appear to present an indeterminate amount of ecological risk at one sampling station. Total PAHs exceeded the screening level of 4 mg/kg. The more detailed sampling indicated that one location exceeded a concentration of 12.2 mg/kg.

The detection of PCDDs and PCDFs expressed as TCDD equivalents in flood plain soils indicate the potential COPCs to bioaccumulate in the aquatic food web. The TCDD equivalent levels were detected below the human health level of 1 µg/kg.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) were developed for the Conroe Site for those chemical and contaminant sources that pose a carcinogenic risk above EPA's target cancer risk range or non-carcinogenic hazard to human health and the environment based on site-specific risk calculations. RAOs are also defined such that Applicable or Relevant and Appropriate Requirements (ARARs) are met. The RAOs refer to specific sources, contaminants, pathways, and receptors. The EPA's removal action has addressed the soil and sediment contamination at this site and has addressed the following RAOs:

1 Prevent direct contact, ingestion, and inhalation of surface and subsurface soils that exceed human health based levels for the chemicals of concern.
2 Prevent direct contact, ingestion, and inhalation of sediments in the drainage areas and creek that exceed human and ecological based levels for the chemicals of concern.
3 Prevent the release of contaminants to surface and subsurface soils, surface water, and ground water. Protect off site ecological receptors by preventing off site contaminant migration as a result of on-site releases.

The existing contamination in the Sand-1 aquifer, which has the potential to form part of the local water supply for private residences as well as the City of Conroe, exceeds the MCLs established under the Safe Drinking Water Act. The Sand-2 aquifer, which is a part of the local drinking water supply for nearby private residences as well as the City of Conroe, has not been contaminated. Thus, protecting the Sand-2 aquifer from contamination as well as returning the contaminated portion of the Sand-1 aquifer to its beneficial use forms the basis for the following site-wide RAOs.

- Minimize further migration of the contaminant plume in the Sand-1 aquifer and prevent migration of contaminants to the Sand-2 aquifer.
- Restoration of the ground water throughout the contaminant plume to its expected beneficial uses wherever practicable. This objective will require a much longer time frame to achieve with an optimum period of 10 years but may take up to 20 years.

While there is no current exposure to contaminated ground water above acceptable risk levels, monitoring of the ground water will be necessary to ensure Site conditions do not change, resulting in exposure to contaminated ground water that is above acceptable risk levels. The Remedial Goals for chemicals of concern (COC) in ground water are based on the MCLs established under the Federal Safe Drinking Water Act. The COC in ground water for this Site is pentachlorophenol and the remedial goal is 1 µg/L. While the chromium detected in the ground water is above the corresponding MCL of 100 µg/L, the chromium is a product of the leachate originating from the grout used in the monitoring well construction. The presence of chromium does not indicate a contaminant plume but rather a contamination affecting the immediate Site that will be addressed during the periodic monitoring well development.

SUMMARY OF REMEDIAL ALTERNATIVES

Alternative 1: No Action

Estimated Capital Cost: $0
Estimated Annual O&M Costs: $0
Estimated Present Worth: $0

Regulations governing the Superfund program, 40 C.F.R. § 300.430(e)(6) require that the "no action" alternative be evaluated at every Site to establish a baseline for comparison. Under this alternative, EPA would take no action at the Site to prevent exposure to the ground water contamination.

Alternative 2: Monitored Natural Attenuation

Estimated Capital Cost: $0
Estimated Annual Monitoring Costs: $23,000 - $84,000
Estimated Present Worth (7%): $442,000
Time Needed to Implement Remedy: 3 - 6 months

Alternative 2 includes a long-term ground water monitoring plan to track the effectiveness of natural attenuation processes. Monitored natural attenuation includes biodegradation and the physical processes of dilution and dispersion, to reduce contaminant concentrations below the remedial goals. Ground water sampling activities indicate aerobic conditions in the Sand-1 aquifer which is conducive to degradation of the PCP plume, and there are no anticipated degradation products that would be more toxic than the PCP. In addition, the plume is predicted to be relatively stable with little or no further migration since there is not a separate NAPL source for additional dissolved PCP in the Sand-1 aquifer.

Institutional controls would be implemented through a property easement and other mechanisms to prevent future use of the Sand-1 aquifer until the remedial goals have been attained across the Site and to prevent the installation of wells within the former process and disposal areas.

Contingency measures would also be included to address future scenarios whereby contaminant concentrations are not decreasing at a sufficiently rapid rate to meet the remediation objectives or contaminant concentrations show an unexpected trend of increasing concentrations. For this Site, contingency measures would include the injection of an oxygen (either air or a liquid additive) and/or nutrients via wells to enhance the natural degradation of the PCP.

Alternative 3: Ground Water Pump and Treat

Estimated Capital Cost: $135,000
Estimated Annual Operation & Maintenance Costs: $54,500
Estimated Present Worth (7%) for System: $518,000
Estimated Annual Monitoring Costs: $23,000 - $84,000
Estimated Present Worth (7%) for Monitoring Costs: $442,000
Total Estimated Present Worth (7%) for Alternative 3: $960,000
Time Needed to Implement Remedy: 12 - 18 months

In Alternative 3, the ground water would be restored to drinking water quality through extraction and treatment to meet the final cleanup levels throughout the entire plume. Ground water will be pumped from a series of wells screened in the Sand-1 interval at an estimated total rate of 10 to 20 gallons per minute. The ground water pumping will provide hydraulic control and maximize the mass removal from the contaminant plume. For cost estimating purposes, the system is predicted to operate for 10 years after which time the system's efficiency is expected to decline due to declining concentrations in the ground water. Since the cleanup time frame may extend to 20 years before the remedial goals are achieved throughout the Site, the ground water monitoring is expected to last 20 years.

The extracted ground water would be treated through a granular activated carbon (GAC) unit to remove the organic

contaminants. Disposal of the spent carbon granules will be accomplished through off-site disposal or regeneration at a permitted facility. Disposal of the treated ground water may be accomplished via discharge into the adjacent Stewart's Creek. The treated water will be required to meet the discharge standards under the National Pollutant Discharge Elimination System (NPDES).

Institutional controls would be implemented through a property easement and other mechanisms to prevent future use of the Sand-1 aquifer until the remedial goals have been attained across the Site and to prevent the installation of wells within the former process and disposal areas.

EVALUATION OF ALTERNATIVES

Pursuant to 40 C.F.R. § 300.430(e)(9)(iii), nine criteria are used to evaluate the different remediation alternatives individually and against each other in order to select a remedy. The nine evaluation criteria are: (1) overall protection of human health and the environment; (2) compliance with ARARs; (3) long-term effectiveness and permanence; 4) reduction of toxicity, mobility, or volume of contaminants through treatment; (5) short-term effectiveness; (6) implementability; (7) cost; (8) State acceptance; and (9) community acceptance. This section of the Proposed Plan profiles the relative performance of each alternative against the nine criteria, noting how it compares to the other options under consideration. The nine evaluation criteria are discussed below. The "Detailed Analysis of Alternatives" can be found in the FS.

1. Overall Protection of Human Health and the Environment: Alternatives 2 and 3 provide adequate protection of human health and the environment. Alternative 2 provides for control of the exposure route through institutional controls and ground water monitoring to evaluate the effectiveness of natural attenuation in achieving the Remedial Goals. Alternative 3 achieves the goal through the physical extraction and treatment of the contaminated ground water combined with institutional controls. Since there is no current exposure route or expected demand for water from the Sand-1 aquifer, the level of overall protection to human health and the environment provided by Alternative 2 is comparable to the level provided by the ground water pump and treat system in Alternative 3. Alternative 1 does not provide a means for monitoring the reduction in contaminant concentrations in the ground water. Alternative 1 does not provide adequate protection of human health and the environment.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs): Alternatives 2 and 3 are both expected to achieve the chemical-specific ARARs for ground water based on the MCLs for contaminants in drinking water. Alternative 3 would also have to meet the substantive requirements of the NPDES permitting program including the development of the discharge limitations for Stewart's Creek and the monitoring of the discharge. Alternative 1 would not provide a means to verify the achievement of ARARs at the Site.

3. Long-term Effectiveness and Permanence: Alternatives 2 and 3 will both be able to provide the same long-term effectiveness and permanence through the use of ground water monitoring and institutional controls to prevent exposure to potential receptors.

4. Reduction of Toxicity, Mobility or Volume Through Treatment: The ground water contamination does not represent a principal or low level threat at this Site. Therefore, treatment to reduce the toxicity, mobility, or volume of contamination in the ground water is not necessarily appropriate at this Site to achieve the remedial action objectives and goals. Alternative 3 will achieve the reduction through the removal of organic contaminants from the extracted ground water followed by off-Site disposal.

5. Short-Term Effectiveness: Alternatives 2 and 3 would not affect the levels of risk to the community during remedy implementation and typical health and safety protocols will minimize the risk to on-site workers during remedy construction or sampling activities.

6. Implementability: Alternatives 2 and 3 are both technically feasible to implement and can be accomplished with existing technology. Implementation issues are further expanded under Alternative 3 with the administrative requirements for transportation and off-site disposal of the granular activated carbon from the treatment process and the additional permitting for discharge of treated water into Stewart's Creek.

7. Cost: There are no costs associated with Alternative 1, No Action, and the highest costs are associated with Alternative 3, Ground Water Pump and Treat. The total costs for Alternative 3 at $960,000 are significantly higher than Alternative 2, Monitored Natural Attenuation, with costs of $442,000 due to the installation of the extraction wells and operation of the treatment process. Costs for both Alternatives 2 and 3 include ground water monitoring requirements to track the progress of the site cleanup.

8. State Acceptance: State acceptance is provided through TCEQ's participation in reviewing and providing

comments on the RI, HHRA, and FS reports and this Proposed Plan. TCEQ has provided technical support on EPA efforts for the Site. The EPA will continue to consult with TCEQ in the selection of the remedy for the Site.

9. Community Acceptance: Community acceptance is an important consideration in the final decision for the Site, and accordingly a public meeting will be scheduled to receive oral and written public comments. Written comments will also be accepted through the mail. The EPA will determine which components of alternatives interested persons in the community support, have reservations about, or oppose. The EPA will carefully consider all public comments received during the comment period before making a final decision on the remedy for the Conroe Creosoting Site.

SUMMARY OF THE PREFERRED ALTERNATIVES

Recommend No Further Remedial Action for Soils and Sediments

The EPA recommends no further action for the contaminated soils and sediments identified at the Conroe Site based on EPA's removal action conducted from September 2002 through August 2003. The removal action, as implemented, is protective of human health and the environment. The removal action resulted in removal of contaminated soils and sediments and the placement of those contaminated materials in an on-site Resource Conservation and Recovery Act (RCRA) containment cell. Approximately 300,000 cubic yards of contaminated soils and sediments will be placed in the on-site RCRA cell. The removal action meets the RAOs identified for the Site. By placing the contaminated materials in the on-site RCRA cell, the removal action eliminated the source of contamination and thus, the human and environmental exposure pathways. Therefore, no further remedial action is necessary for the Conroe Site soils and sediments to protect human health and the environment.

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of remedial action to ensure that the remedy is or will be protective of human health and the environment.

Preferred Ground Water Alternative

The preferred alternative for addressing the contaminants in the ground water and meeting the remedial action objectives is Alternative 2: Monitored Natural Attenuation. Ground water monitoring would be performed to verify that natural attenuation is successful in achieving the reduction in contaminant concentrations in the ground water. Institutional controls would be implemented for the property preventing usage of the Sand-1 aquifer and the installation of additional water supply wells within the former process or contaminated areas at the Site. The preferred alternative is considered more cost effective because the same degree of protectiveness to human health and the environment is realized at half the cost. No risks were identified to off-site residents.

Following the first five year review period after implementation of Alternative 2, the ground water analytical results will be evaluated to determine the effectiveness of natural attenuation. To ensure that the remedy remains protective of human health, the conditions which existed as the basis for implementation of Alternative 2 will be verified during the review of the natural attenuation effectiveness. If any conditions change during the five-year review period, the situation will be reevaluated and appropriate action will be taken.

COMMUNITY PARTICIPATION

The EPA has conducted monthly open house meetings since April 2003 to update the public on the status of the removal action and the results of the ground water investigation. The public is invited to review and comment on the alternatives described in this Proposed Plan. Additional information can be found in the Remedial Investigation, the Baseline Human Health Risk Assessment, and Feasibility Study reports which are included in the Administrative Record file for the Conroe Site along with other pertinent documents. The Administrative Record file is available for review at the document repositories listed beginning on page 1.

The public comment period begins on July 18, 2003, and ends on August 18, 2003. During the public comment period, written comments may be submitted to:

Mr. Tim Wilson
Community Relations Coordinator/S.E.E.
U.S. EPA (6SF-PO)
1445 Ross Avenue
Dallas, Texas 75202-2733

Additionally, oral comments will be accepted at a public meeting scheduled for July 31, 2003, beginning at 7:00 p.m., at the Runyan Elementary School Cafeteria located at 1101 Foster Drive, in Conroe, Texas. The EPA will respond to all comments about the Proposed Plan received during the public comment period in a document called a Responsiveness Summary. The Responsiveness Summary will be attached to the Record of Decision (ROD) for Conroe Site and will be made available to the public in the information repositories. The ROD will present EPA's decision regarding future remedial action at the Conroe Site and will explain the rationale for the selected Site remedy based on public comments. The EPA's recommendation in this Proposed Plan could change depending upon new information which EPA may consider as a result of the public comments received. Any aspects of the proposed action that are significantly different from the Proposed Plan will be explained in the ROD.

FOR MORE INFORMATION

For more information about the public involvement process or if you have questions about activities at the Conroe Site, please contact:

Vincent Malott, Remedial Project Manager
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(512) 239-2462

Tim Wilson, Community Relations Coordinator/S.E.E.
U.S. EPA (6SF-PO)
(214) 665-2248 or 1-800-533-3508 (Toll Free)

Media inquiries should be directed to David Bary, U.S. EPA Region 6 Press Officer, 214-665-2208.

Additional information about the Superfund program can be found at www.epa.gov/region6/superfund.

Call U.S. EPA at 1-800-533-3508 to receive a Spanish translation of this fact sheet.

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Para recibir una traducción en español de esta hoja de datos, comunicarse con la Agencia de Protección del Medio Ambiente de los EEUU (la EPA) al número de teléfono 1-800-533-3508.